Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

Date: **October 22, 2008**

To: **Iowa Stakeholders**

From: **Alex Moon, Supervisor, Land Quality Bureau**

Re: **Request for Comments Regarding Proposed Versions of Rule Revisions for Construction and Demolition Waste Landfills**

This document is for Iowa stakeholders who have an interest in disposal requirements for construction and demolition (C&D) wastes. It is intended to increase awareness as it relates to the construction and demolition (C&D) waste stream and to solicit feedback from stakeholders on proposed revisions to rule requirements for C&D landfill disposal sites.

C&D waste is defined as "waste building materials including wood, metals and rubble which result from construction and demolition of structures." While there is much data on the characterization of municipal solid waste (MSW) landfills and the leachate that they generate, C&D waste landfills have largely been ignored. This is because the waste going into them has historically been viewed as benign in comparison to MSW landfills. It was felt that since the waste was relatively stable in comparison to MSW, these landfills did not pose a threat to the environment. Even by the definition above, this waste stream seems fairly harmless. However, with the review of groundwater data and more focus on the composition of C&D waste, this belief is receiving further scrutiny.

C&D waste comes from residential, commercial, and industrial activities. Most of the waste is considered relatively inert, however C&D waste also contains materials that may be hazardous or potentially toxic. They can be divided into four categories:

- Excess materials used in construction, and their containers. *Examples: adhesives and adhesive containers, leftover paint and paint containers, excess roofing cement and roofing cement cans;*
- Waste oils, grease, and fluids. *Examples: machinery lubricants, brake fluid, form oil, engine oil;*
- Other discrete items. *Examples: batteries, fluorescent bulbs, appliances;* and
- Inseparable constituents of bulk items. *Examples: formaldehyde present in carpet, treated or coated wood.*

The following table represents data from the National Association of Demolition Contractors' (NADC's) *C&D Waste Characterization Database.* The bold print denotes the components

referred to by contributing sources as either hazardous, excluded, contaminants, unacceptable, potentially toxic, or illegal.

ASPHALT paving shingles	**PAINT** **paint containers and waste** **paint products**	**WALL COVERINGS** **drywall (gypsum)** plaster
EARTH dirt sand, foundry soil	**PAPER PRODUCTS** cardboard fiberboard, paperboard paper	**WOOD** cabinets composites mill ends pallets, shipping skids, and crating lumber particle board plywood siding trees: limbs, brush, stumps, and tops veneer
ELECTRICAL fixtures wiring	**PETROLEUM PRODUCTS** **brake fluid** **form oil** **fuel tanks** **oil filters** **petroleum distillates** **waste oils and greases**	**WOOD CONTAMINANTS** **adhesives and resins** **laminates paintings and coatings** **preservatives** **stains/varnishes** **other chemical additives**
INSULATION **asbestos** building extruded polystyrene (rigid) **fiberglass (bat)** roofing	**PLASTICS** buckets pipe (PVC) polyethylene sheets styrofoam sheeting or bags laminate	**MISCELLANEOUS** **adhesives and adhesive cans** **aerosol cans** **air conditioning units** **appliances ("white goods")** **batteries** **carpeting** **caulk (tubes)** ceiling tiles **driveway sealants (buckets)** **epoxy containers** **fiberglass** fines fireproofing products(overspray) floor tiles **furniture** **garbage** glass **lacquer thinners** leather **light bulbs, fluorescent and HID** light bulbs, other linoleum organic material packaging, foam **pesticide containers** rubber **sealers and sealer tubes** sheathing silicon containers **solvent containers and waste** street sweepings textiles **thermostat switches** **tires** **transformers** water treatment plant lime sludge
MASONRY AND RUBBLE bricks cinder blocks concrete mortar, excess rock stone tile	**ROOF MATERIALS** **asbestos shingles** roofing, built up **roofing cement cans** roofing shingles porcelain roofing tar tar paper	
METAL aluminum (cans, ducts, siding) brass fixtures, plumbing flashing gutters **mercury from electrical switches** iron **lead** nails pipe (steel, copper) sheet metal steel (structural, banding, decking, rerod) studs, metal wire (e.g., copper)	**VINYL** siding flooring doors windows	

As evidenced by the list of materials above, the composition of C&D waste is highly variable and is a potential problem because it may contain harmful concentrations of hazardous constituents found in the waste. Based on the results of a statistical analysis, the following parameters in C&D leachate could present a risk to human health and the environment because they exceed primary groundwater standards, secondary groundwater standards or guidance concentrations for groundwater:

Methylene Chloride	*1,2-Dichloroethane*	*Cadmium*	*Lead*
Iron	*Total Dissolved Solids*	*Manganese*	*Sulfate*

The analysis concluded that some degradation of groundwater could occur as a result of these contaminants being present in the leachate. For these reasons, C&D waste can no longer be ignored and classified as innocuous. Documents and reports substantiating the data above have been placed on the Department's website at http://www.iowadnr.com/waste/policy/C&Dlandfill.html for your review.

In the state of Iowa, there are 4 landfills permitted to accept only C&D waste. 567-Chapter 114 of the Iowa Administrative Code is dedicated to the design and operation of these facilities. These 4 landfills combined dispose of approximately 30,000 tons of C&D waste on an annual basis. In comparison, there are 45 municipal solid waste (MSW) landfills in the state that are permitted to accept household, commercial and industrial wastes of which C&D wastes can be a subset of. Data reports show that these landfills accepted a combined total of 800,000 tons of MSW waste from July 2007 to July 2008. Based on the 2005 update to the Iowa Waste Characterization Study, C&D waste comprises 20 percent of the solid waste stream in Iowa. This equates to approximately 160,000 tons of C&D waste during the previous fiscal year.

While regulations do exist in Iowa for the design and operation of C&D landfills (Iowa Administrative Code 567-Chapter 114), stakeholders have echoed the Department's concerns that the rules and laws pertaining to the management of C&D wastes lack adequate protection for the environment and are not equitable when compared to the rule requirements for MSW landfills. Specific examples included the lesser design standards for C&D landfill liners, minimal groundwater monitoring requirements, less daily waste cover frequency and the tonnage fee exemption allowed for C&D waste landfills in Iowa Code section 455B.310. Because both types of landfills accept C&D waste, the argument has been made before the Environmental Protection Commission (EPC) that both should be required to meet the same standards. While the exemption form the tonnage fee would require a legislative change, which the Department has proposed for the 2009 legislative session, the operation and design inequities can be addressed through rulemaking before the EPC. As a result of the issues brought before the EPC, the Department has agreed to expedite its review Chapter 114 and bring forth proposed revisions to the Commission as soon as possible. It is anticipated that a draft rule revision will be provided to the EPC for review at its January monthly meeting.

Provided below are 4 versions of possible rule revisions that the Department is requesting input on from the public and industry stakeholders. Each proposed version results in the eventual rescission of Chapter 114 with future compliance falling under Chapter 113 for MSW landfills.

At question is the timeframe for existing C&D waste landfills to achieve compliance with Chapter 113 (within 3 years or at the next time of construction for a new disposal cell) and whether or not the existing liner design standards for disposal areas constructed exclusively for C&D waste (4 feet of recompacted clay with no plastic component or engineering modeling required) should be amended into Chapter 113. Version 1 proposes the most aggressive approach while Version 4 is the least aggressive. New text is underlined and any deletions are shown as strikethroughs. All changes are highlighted in red.

Receiving input and feedback is important because it will help the Department draft rules for the management of C&D waste disposal in Iowa. The Department is specifically requesting detailed responses and comments pertaining to any or all of the following proposed rule versions. To assist with your review, an explanation of what each version is intended to accomplish is provided below. If you require further explanation of what each version proposes to do, please do not hesitate to contact the Department.

The Department is accepting written public comments pertaining to the proposed revisions until the close of business on Monday, December 1, 2008. If the comments warrant further discussion, the Department will schedule public meetings to discuss them with the public in greater detail. Persons wishing to provide written comments should submit them to the following address:

Iowa Department of Natural Resources
Attn: Alex Moon
502 East 9th St.
Des Moines, IA 50319

When submitting comments, the Department encourages stakeholders to utilize the following guidelines. These guidelines aid the Department in accurately understanding your input.

- Include your name, mailing address and contact information.
- Please state if you are submitting comments as an individual, or for a business or organization.
- Explain your views as clearly as possible by describing why one version is more appropriate over another and any assumptions, data, or technical information you utilized.
- Provide specific examples to illustrate your concerns, as well as copies of technical documents or references.

Thank you for your responses and comments.

Version 1

Sets a timeframe of 3 years to continue operation of a C&D landfill. Existing C&D landfills must either close after 3 years or provide a schedule for coming into compliance with Chapter 113 at the end of the 3-year compliance window. Municipal solid waste landfills (MSWLFs) having constructed a C&D cell also have 3 years to continue using the C&D cell. Permit renewals and expansions to construct a new C&D cell meeting the requirements of Chapter 114 would be allowed during the 3-year compliance window but approval would expire at the end of the 3-year window. Chapter 114 then expires after the 3-year compliance window. Under this version, C&D landfills and MSW landfills with separate C&D disposal cells may be required to cease waste disposal while there is remaining capacity. This version would essentially remove any separate distinction of a C&D disposal site within a 3-year timeframe.

ITEM 1. Amend rule 567-114.7(455B) as follows:

114.7(1) *Design and construction.* Sanitary disposal projects designed and constructed in accordance with rules in effect at the time of construction shall not be required to be redesigned or reconstructed due to subsequent rule changes unless the Department finds that such facilities are causing pollution. Such facilities shall be brought into compliance with rules in effect at the time of reconstructing, enlarging, or otherwise modifying the sanitary disposal project, or at the time of permit renewal.

114.7(2) *Operation.* If any new rule conflicts with an operating procedure prescribed in the engineering plans or the permit of a sanitary disposal project, the operation shall conform with the new rule.

114.7(3) Owners or operators of sanitary landfills accepting only construction and demolition wastes may continue accepting such wastes after [the effective date of these rules] but shall submit an implementation plan to the Department by January 1, 2010 that identifies how the owner or operator shall achieve compliance with 567-Chapter 113. The plan shall include a compliance schedule, which shall not extend beyond July 1, 2012.

114.7(4) Owners or operators of construction and demolition sanitary landfills that do not comply with the provisions of subrule 113.7(4) shall cease accepting waste by July 1, 2012 and complete closure activities in accordance with an approved closure plan by July 1, 2013.

114.7(5) Owners or operators of municipal solid waste sanitary landfills with special permit provisions authorizing the use of disposal areas constructed to meet the requirements of this chapter shall cease accepting waste in such areas by July 1, 2012.

114.7(6) This chapter shall be rescinded in its entirety effective July 1, 2012.

Version 2

Allows C&D landfills and MSW landfills with separate disposal areas constructed to Chapter 114 standards, to use all of their remaining constructed capacity, provided the facility is not causing pollution. After the rule change is approved, any new proposal for a C&D landfill, request to construct more cells (lateral expansion) or request to increase the disposal capacity through a vertical expansion at an existing landfill would follow the requirements of Chapter 113. Chapter 114 would be rescinded at an unknown later date. This version also does away with the separate distinction for C&D disposal sites but at an unknown date depending on remaining constructed disposal capacity at existing landfills. However, it allows the use of all remaining constructed capacity which serves as a grandfather clause.

ITEM 1. Amend rule 567-114.7(455B) as follows:

114.7(1) *Design and construction.* Sanitary disposal projects designed and constructed in accordance with rules in effect at the time of construction shall not be required to be redesigned or reconstructed due to subsequent rule changes unless the Department finds that such facilities are causing pollution. Such facilities shall be brought into compliance with rules in effect at the time of reconstructing, enlarging, or otherwise modifying the sanitary disposal project, or at the time of permit renewal.

114.7(2) *Operation.* If any new rule conflicts with an operating procedure prescribed in the engineering plans or the permit of a sanitary disposal project, the operation shall conform with the new rule.

114.7(3) No new permit or expansion, either vertical or lateral, shall be issued under the provisions of this chapter after [the effective date of these rules]. Any new permit or lateral expansion of a sanitary landfill accepting only construction and demolition wastes shall conform to the provisions of 567-Chapter 113.

Version 3

All of Version 1 outcomes apply except that the liner system design requirements for a C&D landfill unit remain the same as allowed for currently under Chapter 114. Existing C&D landfill units constructed with a liner built to the Chapter 114 design requirements could continue to be used beyond the 3-year compliance window if capacity remained; however, all other provisions of Chapter 113 would need to be implemented after the 3-year timeframe. Because of the proposed inclusion of a lesser design standard for C&D waste liner systems, this version carves out a niche for landfills solely dedicated to taking C&D waste and separate C&D disposal areas at MSW landfills to still exist after the 3-year compliance window expires.

ITEM 1. Amend rule 567-114.7 as follows:

114.7(1) *Design and construction.* Sanitary disposal projects designed and constructed in accordance with rules in effect at the time of construction shall not be required to be redesigned or reconstructed due to subsequent rule changes unless the Department finds that such facilities are causing pollution. Such facilities shall be brought into compliance with rules in effect at the time of reconstructing, enlarging, or otherwise modifying the sanitary disposal project, or at the time of permit renewal.

114.7(2) *Operation.* If any new rule conflicts with an operating procedure prescribed in the engineering plans or the permit of a sanitary disposal project, the operation shall conform with the new rule.

114.7(3) Owners or operators of sanitary landfills accepting only construction and demolition wastes may continue accepting such wastes after [the effective date of these rules] but shall submit an implementation plan to the Department by January 1, 2010 that identifies how the owner or operator shall achieve compliance with 567-Chapter 113. The plan shall include a compliance schedule, which shall not extend beyond July 1, 2012.

114.7(4) Owners or operators of construction and demolition sanitary landfills that do not comply with the provisions of subrule 113.7(4) shall cease accepting waste by July 1, 2012 and complete closure activities in accordance with an approved closure plan by July 1, 2013.

114.7(5) Owners or operators of municipal solid waste sanitary landfills with special permit provisions authorizing the use of disposal areas constructed to meet the requirements of this chapter shall cease accepting waste in such areas by July 1, 2012.

114.7(6) This chapter shall be rescinded in its entirety effective July 1, 2012.

ITEM 2. Amend rule 567-113.7(5) as follows:

113.7(5) *MSWLF unit liners and leachate collection systems.* The liner and leachate collection system for a new MSWLF unit shall be constructed in accordance with the requirements of this subrule. Except for MSWLF units that accept only construction and demolition wastes, ~~A~~all active portions must have a composite liner or an alternative liner approved by the Department. An MSWLF unit must have a functioning leachate collection system during its active life.

a. *Liner systems.* An MSWLF unit shall have a liner system that complies with either the composite liner requirements of subparagraph 113.7(5)*"a"*(1) or an alternative liner system that complies with the requirements of subparagraph 113.7(5)*"a"*(2). An MSWLF unit that accepts only construction and demolition wastes may utilize a liner system that complies with subparagraph 113.7(5)"a"(1), (2) or (3). Liners utilizing compacted soil must place the compacted soil in lifts no thicker than 8 inches after compaction.

(1) Composite liner systems.

1. A composite liner consists of two components, an upper flexible membrane liner (FML) and a lower compacted soil liner.

2. The upper component must consist of a minimum 30-mil flexible membrane liner (FML). FML components consisting of high-density polyethylene (HDPE) shall be at least 60 mil thick. The FML component must be installed in direct and uniform contact with the lower compacted soil component.

3. The lower component must consist of at least a 2-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second (cm/sec). The compacted soil must be placed in lifts no thicker than 8 inches after compaction.

4. The composite liner must be adequately sloped toward the leachate collection pipes to provide drainage of leachate. Unless alternative design requirements to this performance standard are approved as part of the permit under subrule 113.2(11) (relating to equivalency review procedure), the leachate collection system shall have a slope greater than or equal to 2 percent and not exceeding 33 percent.

(2) Alternative liner systems.

1. The design must ensure that the concentration values listed in Table I of rule 113.7(455B) will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified pursuant to numbered paragraph 113.7(5)"a"(2)"2." Alternative liners utilizing compacted soil must place the compacted soil in lifts no thicker than 8 inches.

2. The relevant point of compliance specified by the Department must be within 50 feet of the planned liner or waste boundary, unless site conditions dictate otherwise, downgradient of the facility with respect to the hydrologic unit being monitored in accordance with subparagraph 113.10(2)"a"(2), and located on land owned by the owner of the MSWLF unit. The relevant point of compliance specified by the Department shall be at least 50 feet from the property line of the facility.

3. When approving an alternative liner design, the Department shall consider at least the following factors:

- The hydrogeologic characteristics of the facility and surrounding land.
- The climatic factors of the area.
- The volume and physical and chemical characteristics of the leachate.
- The sensitivities and limitations of the modeling demonstrating the applicable point of compliance.
- Practicable capability of the owner or operator.

4. The alternative liner must be adequately sloped toward the leachate collection pipes to provide drainage of leachate. Unless alternative design requirements to this performance standard are approved as part of the permit under subrule 113.2(11) (relating to equivalency review procedure), the leachate collection system shall have a slope greater than or equal to 2 percent and not exceeding 33 percent.

Table I

Chemical	MCL (mg/l)
Arsenic	0.01
Barium	1.0
Benzene	0.005
Cadmium	0.01
Carbon tetrachloride	0.005
Chromium (hexavalent)	0.05
2,4-Dichlorophenoxy acetic acid	0.1
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
Endrin	0.0002
Fluoride	4.0
Lindane	0.004
Lead	0.05
Mercury	0.002
Methoxychlor	0.1
Nitrate	10.0
Selenium	0.01
Silver	0.05
Toxaphene	0.005
1,1,1-Trichloromethane	0.2
Trichloroethylene	0.005
2,4,5-Trichlorophenoxy acetic acid	0.01
Vinyl chloride	0.002

(3) Liner systems for MSWLF units accepting only construction and demolition wastes.

1. MSWLF units accepting only construction and demolition wastes may utilize a liner system meeting 113.7(5)“a”(1), 113.7(5)“b”(2), or a soil liner consisting of at least four feet of recompacted soil. The description, source and volume of the material to be used for the landfill

liner, including the method of installation, must be provided. The coefficient of permeability must be 1 × 10-7 cm/sec (0.00028 ft/day) or less as determined by appropriate laboratory analysis. The percent of standard or modified proctor density at moisture contents consistent with expected field conditions and corresponding to a measured coefficient of permeability equal to or less than 1 × 10-7 cm/sec shall be determined in the laboratory. The soil shall be placed in lifts not to exceed 8 inches in thickness. A minimum of one field density test shall be performed per lift per acre to verify that the density determined by the laboratory analysis as correlated to permeability has been achieved. Results of field density tests shall be submitted to the Department prior to the placement of solid waste.

Version 4

All of Version 2 outcomes apply except that the liner system design requirements for a C&D landfill unit remain the same as allowed for currently under Chapter 114. Existing C&D landfill units constructed with a liner built to the Chapter 114 design requirements could continue to be used following the provisions of Chapter 114 until the constructed capacity was exhausted. However, excluding the prescriptive composite and alternative liner design requirements in Chapter 113, all other provisions of Chapter 113 would apply whenever a new C&D landfill or lateral or vertical expansion of an existing C&D landfill unit is proposed. Therefore, no 3-year compliance window applies. Similar to Version 3, because of the proposed inclusion of a specified design standard for C&D waste liner systems, this version carves out a niche for C&D landfill units constructed to lesser design standards for the liner system to continue to exist.

ITEM 1. Amend rule 567-114.7(455B) as follows:

114.7(1) *Design and construction.* Sanitary disposal projects designed and constructed in accordance with rules in effect at the time of construction shall not be required to be redesigned or reconstructed due to subsequent rule changes unless the Department finds that such facilities are causing pollution. Such facilities shall be brought into compliance with rules in effect at the time of reconstructing, enlarging, or otherwise modifying the sanitary disposal project, or at the time of permit renewal.

114.7(2) *Operation.* If any new rule conflicts with an operating procedure prescribed in the engineering plans or the permit of a sanitary disposal project, the operation shall conform with the new rule.

114.7(3) No new permit or expansion, either vertical or lateral, shall be issued under the provisions of this chapter after [the effective date of these rules]. Any new permit or lateral expansion of a sanitary landfill accepting only construction and demolition wastes shall conform to the provisions of 567-Chapter 113.

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3. The lower component must consist of at least a 2-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10-7 centimeters per second (cm/sec). The compacted soil must be placed in lifts no thicker than 8 inches after compaction.

4. The composite liner must be adequately sloped toward the leachate collection pipes to provide drainage of leachate. Unless alternative design requirements to this performance standard are approved as part of the permit under subrule 113.2(11) (relating to equivalency review procedure), the leachate collection system shall have a slope greater than or equal to 2 percent and not exceeding 33 percent.

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1. The design must ensure that the concentration values listed in Table I of rule 113.7(455B) will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified pursuant to numbered paragraph 113.7(5)“a”(2)“2.” Alternative liners utilizing compacted soil must place the compacted soil in lifts no thicker than 8 inches.

2. The relevant point of compliance specified by the Department must be within 50 feet of the planned liner or waste boundary, unless site conditions dictate otherwise, downgradient of the facility with respect to the hydrologic unit being monitored in accordance with subparagraph 113.10(2)“a”(2), and located on land owned by the owner of the MSWLF unit. The relevant point of compliance specified by the Department shall be at least 50 feet from the property line of the facility.

3. When approving an alternative liner design, the Department shall consider at least the following factors:

- The hydrogeologic characteristics of the facility and surrounding land.
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